

# **Forte Camera Site Planning Document**

**9347-0110 Rev B**

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## **About This Document**

This document provides site planning information for customers planning to purchase a Forte camera and their facility engineers, structural engineers, site planners and architects.

## **CAD Drawings**

Drawings in a DWG format for the Forte system are downloadable from the following website for architects planning room layouts:

<http://apps1.medical.philips.com/documents>

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# Section 1

## Room Requirements

### General Information

Forte cameras consist of a Gantry, a Collimator Storage Unit (for holding up to four pairs of heavy collimators), a Patient Table, an Acquisition Terminal and a Processing Workstation (also called a PegBlade).

The Gantry is a stationary “ring-shaped” device which Philips anchors to the floor. The Gantry supports two Detectors from which the system collects images of the patient. See illustration on page 1-3.

The Patient Table is on wheels, but, unless moved out of the way to accommodate gurney-bound patients, remains in the same location. As shown on page 1-3, the Patient Table includes a moveable Pallet which translates the patient in and out of the Gantry Ring.

For Emission Computed Tomography (ECT) studies, the two Detectors rotate around a patient lying on the Patient Table in the center of the Gantry Ring.

For Total Body Studies, the two detectors remain above and below the patient. The Patient Table moves the Pallet (and patient) in and out of the Gantry Ring.

To image patients on gurneys, operators move the Patient Table out of the way and place the gurney under the camera but perpendicular to the normal table position.

### Forte Models

There are two models of Forte Cameras:

- Forte with Atlas Electronics Rack (Forte Atlas) - manufactured *before* November 2000 which requires an additional electronic rack in the room.
- Forte with Power Pack (Forte Power Pack) - manufactured *after* December 2000 which have a slightly larger compartment behind the Gantry. That compartment contains the electronic components formerly contained in the separate Atlas Electronics Rack.

### Collimator Storage Unit

The Collimator Storage Unit may contain up to eight collimators (four pairs). Collimators are 21" x 26" (53cm x 66cm) sheets of lead of various thicknesses. Collimators weigh between 110 and 235 lbs (50 and 107 kg).

Prior to performing clinical studies, the operator must transfer a pair of collimators from the Collimator Storage Unit to the pair of Detectors on the Gantry. To do

collimator transfers, the Collimator Storage Unit is on wheels. It moves between “park” and “exchange” positions along an arc around the corner of the Gantry.

## **Left and Right Configurations**

Philips can install the Collimator Storage Unit on either the left or right side of the Gantry.

Philips recommends installing the Collimator Storage Unit on the side of the Gantry where the patient enters the room. This allows operators to assist the patient getting on or off the table and also reach controls on the Display Panel on top of the Collimator Storage Unit.

The operator will also want the Acquisition Terminal on the same side of the Patient Table as the Collimator Storage Unit. Other configurations will require the operator to frequently walk around the Patient Table.

Section 2 contains illustrations of rooms with left and right Collimator Storage Units. Those illustrations show recommended directions of patient access and locations of the Acquisition Terminal.

## **Air Conditioning Requirements**

The Forte camera has the following heat loads:

Forte System	PegBlade	PegBlade Monitor	6.0 KVA UPS (optional)
5,542 BTU/hr 388 Cal/sec 1,623 watts	854 BTU/hr 60 Cal/sec 250 watts	544 BTU/hr 38 Cal/sec 159 watts	1,771 BTU/hr 124 Cal/sec 519 watts

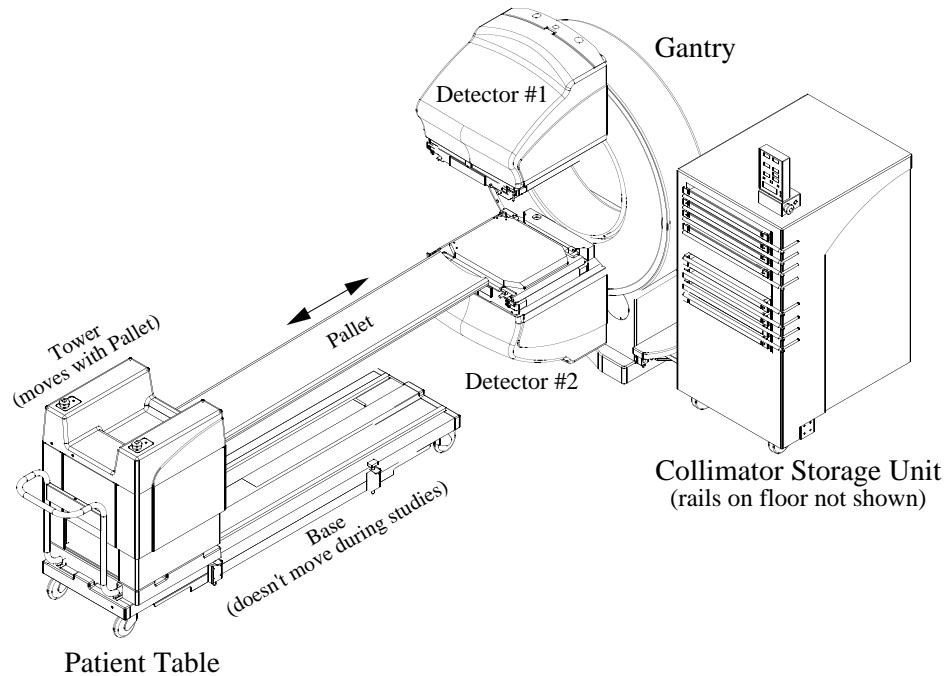
The camera room HVAC system must maintain the temperature between 60°- 75° F (16° - 24° C) with less than 10° F (5° C) variation per hour. Humidity must be between 20% - 75%. These requirements are 24 hours per day, 7 days per week.

## **Floor Levelness Requirements**

The floor under the four Patient Table wheels must be at the same level ( $\pm 0.25"$  or 6 mm) as the floor under the Gantry .

The floor under the Collimator Storage Unit rails must be at the same level ( $\pm 0.125"$  or 3 mm) as the floor under the Gantry.

If floors do not meet these requirements, the customer will need to correct the floor levelness problem before Philips can begin an installation. To avoid trip hazards near the Gantry, Collimator Storage Unit and Patient Table, any floor correction measures (such as grout) must taper down to the existing floor away from the Gantry, Collimator Storage Unit and Patient Table. See illustration on page 6-8.



**Forte Gantry, Collimator Storage Unit and Patient Table.**

## **Room Size Requirements**

Room size requirements are slightly different for Forte Power Pack and Forte Atlas cameras. Room layout drawings appear in Section 2.

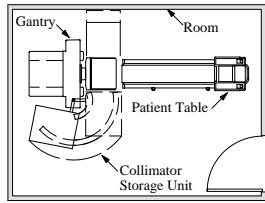
### **Forte Power Pack Cameras**

For Forte Power Pack Cameras, the room sizes requirements differ slightly depending on whether the Collimator Storage Unit is on the left or right side of the Gantry.

Although larger rooms are preferable, acceptably small rooms for Forte Power Pack cameras may have these dimensions:

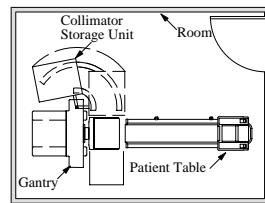
#### **Collimator Storage Unit on left of Gantry**

Width: 13' - 6" (411 cm)  
Length: 18' (549 cm)  
Height: 7' - 7" (231 cm)



#### **Collimator Storage Unit on right of Gantry**

Width: 12' - 10" (391 cm)  
Length: 18' (549 cm)  
Height: 7' - 7" (231 cm)



Forte Power Pack room sizes smaller than 12' - 10" x 18' require approval by Philips Milpitas Site Planning Department.

For new construction, architects should consider increasing the room length to 20'.

### **Forte Atlas Cameras**

For Forte Atlas Cameras, room size requirements are the same for left and right Collimator Storage Units. An acceptably small room may have these dimensions:

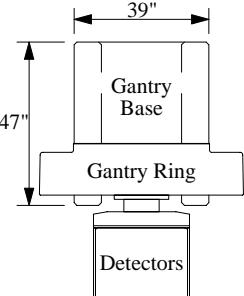
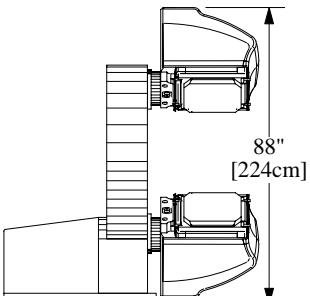
#### **Collimator Storage Unit on left or right of Gantry**

Width: 13' - 6" (411 cm)  
Length: 18' (549 cm)  
Height: 7' - 7" (231 cm)

Forte Atlas Cameras with room sizes smaller than 13' - 6" x 18' require approval by Philips Milpitas Site Planning Department.

For new construction, architects should consider increasing the room length to 20'.

## Equipment Sizes

Forte Power Pack Gantry base (weight is without Collimators)	W: 39", D: 47", H: 88" (99 x 119 x 224cm)	4,512 lbs (2,047 kg)
Forte Atlas Gantry base (weight is without Collimators)	W: 39", D: 47", H: 88" (99 x 119 x 224cm)	4,348 lbs (1,972 kg)
	 A top-down diagram of the gantry base. It shows a central vertical column labeled "Gantry Base" with a horizontal width of 39". At the bottom, it sits on a "Gantry Ring" which supports "Detectors". The total depth from the front face to the back support is 47".	
	 A side profile diagram of the gantry. It shows the vertical "Gantry Base" with a height of 88" (224cm). The gantry is mounted on a base with a horizontal width of 47".	
Collimator Storage Unit (weight is without Collimators)	W: 31", D: 38", H: 61" (79 x 97 x 155cm)	1,068 lbs (484 kg)
Patient Table	W: 27", D: 110", H: 37" (69 x 279 x 94cm)	850 lbs (386 kg)
Processing Workstation (PegBlade) (placed on customer's desktop)	W: 18", D: 18", H: 5" (46 x 46 x 12cm)	27 lbs (12 kg)
Pegasys monitor (placed on customer's desktop)	W: 20", D: 20", H: 20" (50 x 50 x 50 cm)	69 lbs (32 kg)
Acquisition Terminal	W: 33", D: 30", H: 55" (84 x 76 x 140cm)	185 lbs (84 kg)
6.0 KVA UPS (optional)	W: 19", D: 29", H: 14" (48 x 73 x 36cm)	294 lbs (133 kg)
Codonics Printer (optional) (placed on customer's desktop)	W: 17", D: 21", H: 12" (43 x 53 x 30cm)	55 lbs (25 kg)
Atlas Electronics Rack (not part of Forte Power Pack)	W: 34", D: 22", H: 34" (86 x 56 x 86cm)	211 lbs (96 kg)

**Important:** Unless the floor is a ground-level, reinforced 3,000 psi (211 kg/cm<sup>2</sup>), 4.5" thick, poured on grade concrete slab, a licensed structural engineer must evaluate floor loading. To evaluate floor loading, a structural engineer will need the data in Sections 3 and 6 of this document. See Section 5 for shipping sizes or weights.

## **Power Requirements**

Camera. Power requirements for the Forte Camera<sup>1</sup> are as follows:

UPS (optional)	6.0 KVA (manufactured by APC)
Voltage/Current Requirement (with or without UPS):	208 - 240 VAC, 30 amp
Peak current:	15.3 amp at 208 VAC
Steady state current:	4.2 amp at 208 VAC
Phase:	Single Phase
Receptacle (with or without UPS):	L6-30R (dedicated line)

Processing Workstation. Power requirements for Processing Station (PegBlade) are:

Voltage:	115 VAC (U.S.) 220 VAC (International)
Current:	5 amp @ 115 VAC (U.S.) 2.5 amp @ 220 VAC (International)
Receptacle:	Nema 5-20 (dedicated line not required)

## **Vibration Specifications**

Nuclear medicine cameras do not have floor vibration specifications. This is because (1) image collection durations are long (10 - 300 seconds, or more) and floor vibration durations are much smaller, (2) vibrations are typically sinusoidal and, therefore, tend to cancel out, and (3) the patient table and detector/gantry assemblies are both floor mounted and, therefore, vibrate together.

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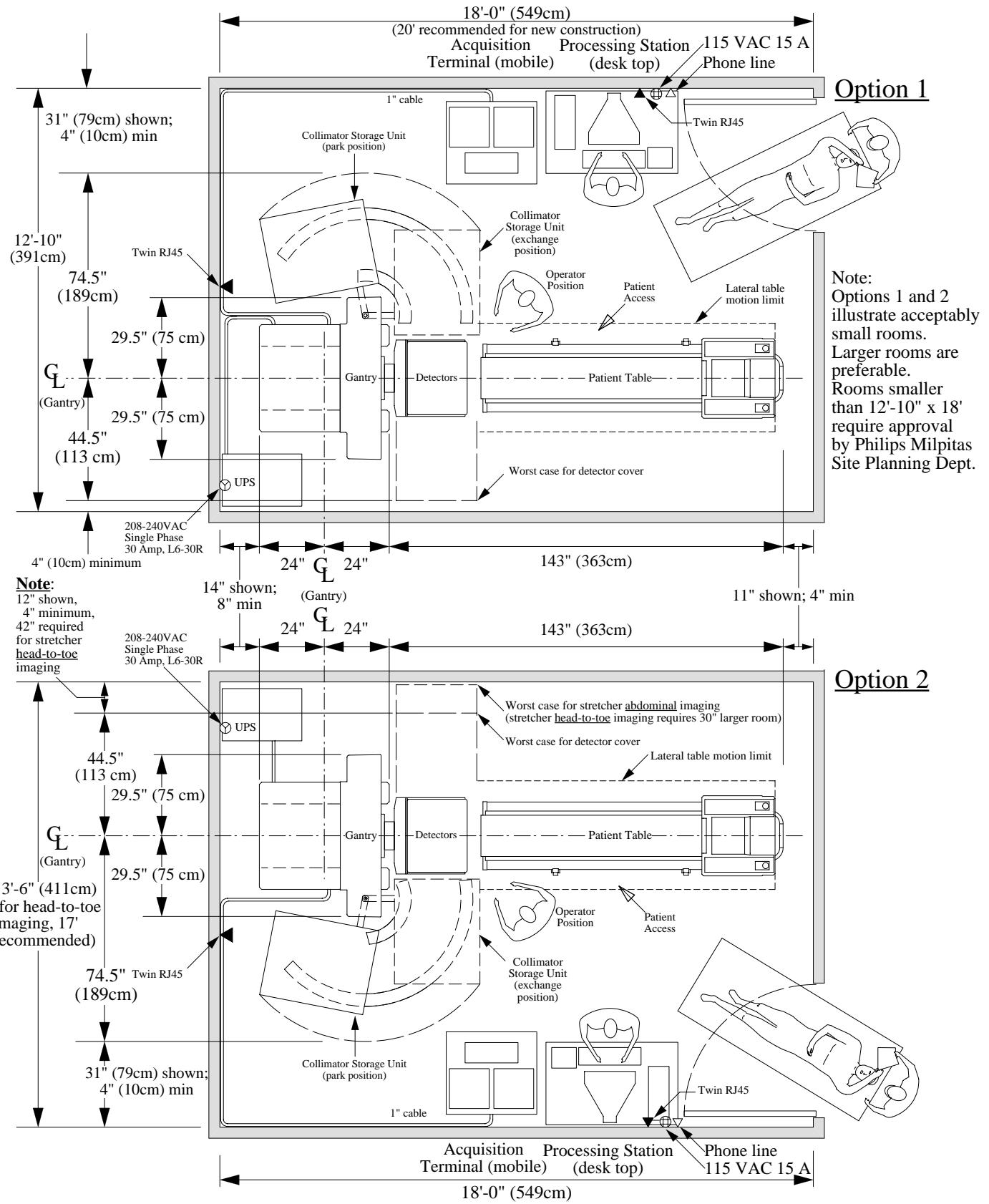
<sup>1</sup> In Forte Atlas cameras, the Atlas Electronics Rack provides power to the Gantry, Collimator Storage Unit, Patient Table and Acquisition Terminal.

In Forte Power Pack cameras, the Gantry provides power to the Collimator Storage Unit, Patient Table and Acquisition Terminal.

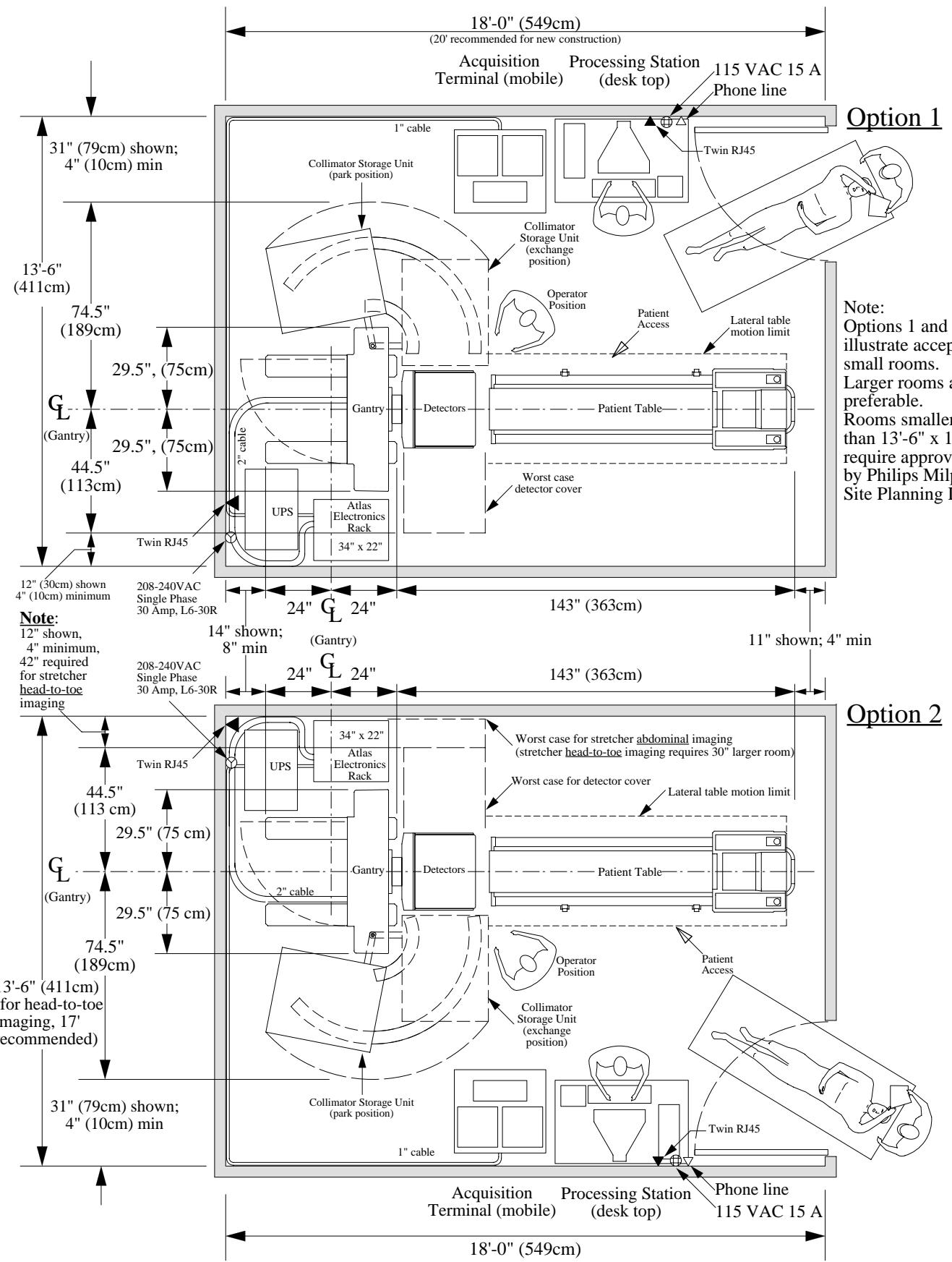
Forte Atlas and Forte Power Pack cameras have the same power requirements.

## Section 2: Room Layouts

### Forte Power Pack with UPS Power



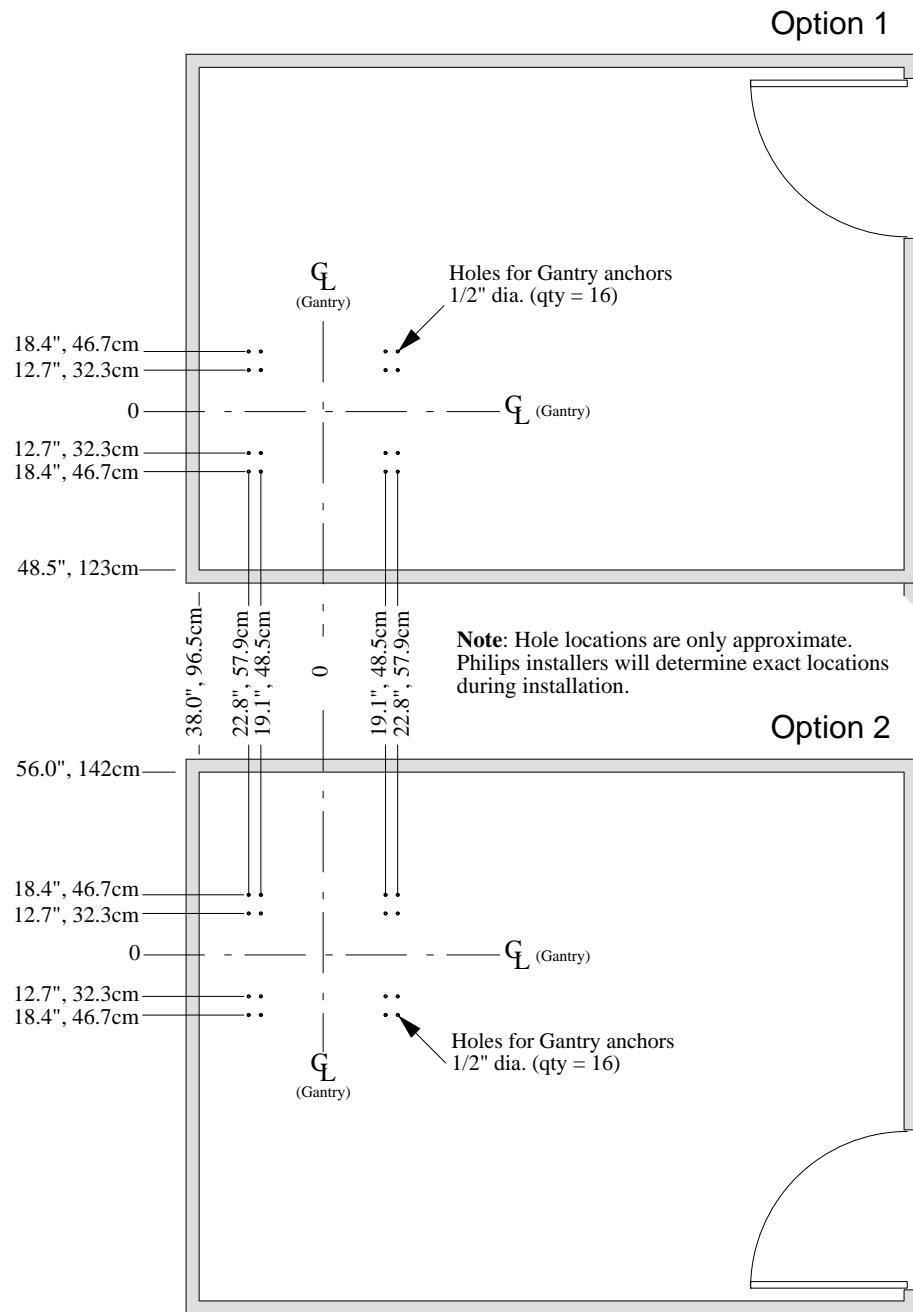
## Forte Atlas with UPS Power



## Section 3 **Anchor Details**

### Anchor Hole Pattern

Philips installers (not customer contractors) will anchor the Forte Gantry to the floor during the installation. This diagram shows the location of the anchors.



## **California OSHPD Information**

In September 2002, Philips applied for California “Pre-approval of Anchorage for Fixed Hospital Equipment” for the Forte Power Pack. We based the application on the new 2001 California Building Code (CBC).

That application, and an older 1998 CBC Pre-approval, are on this website:

<http://apps1.medical.philips.com/documents>

## **Anchor Specifications**

Philips installers use the following expansion anchors for the Forte Gantry.

### **Non-Seismic (non-California) Sites**

<u>Manufacturer</u>	<u>Model</u>	<u>Diameter</u>	<u>ICBO #</u>	<u>Embed</u>	<u>Min. Slab Thickness</u>	<u>Camera Elevation</u>
Hilti	Kwik-Bolt II	1/2"	4627	3.5"	4.5"	No restrictions

### **Seismic (California) Sites**

<u>Manufacturer</u>	<u>Model</u>	<u>Diameter</u>	<u>ICBO #</u>	<u>Embed</u>	<u>Min. Slab Thickness</u>	<u>Camera Elevation</u>
Hilti	Kwik-Bolt II	1/2"	4627	3.5"	4.5"	Ground only
Hilti	Kwik-Bolt II	1/2"	4627	4"	5.25"	less than 1/3 building height

Camera Elevation is the ratio of the camera room floor height and the building roof height (both with respect to ground level).

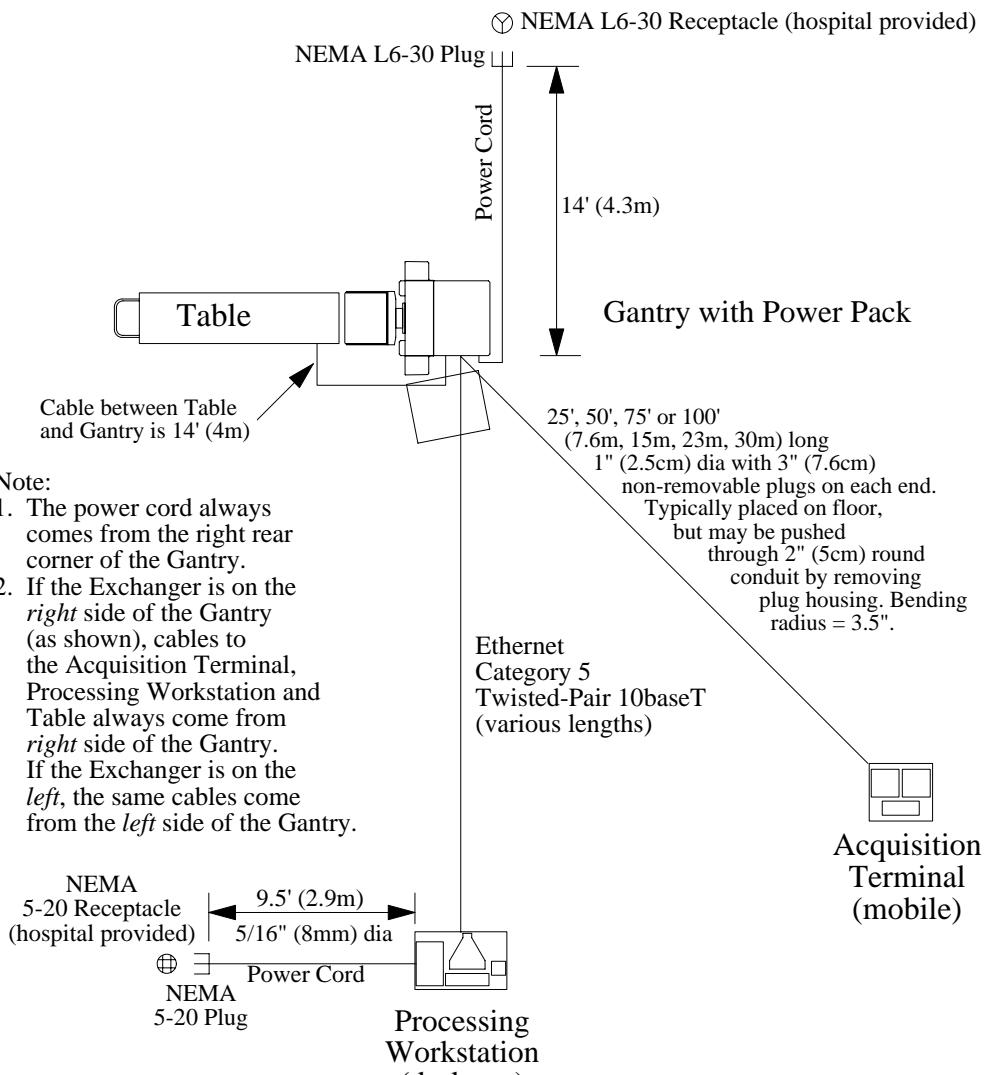
**Note:** Sites that cannot use anchors (because of slab thickness or camera elevation problems) may be through bolted. To do so, a customer must retain a licensed structural engineer to specify the grade of steel for the bolts and the size of under-the-floor plates or washers. The customer must provide the bolts and under-the-floor plates or washers.

For structural engineers specifying a steel plate on top of the floor, the last page in Section 6 describes our requirements.

## Section 4 Gantry Cables

### Gantry Cable Lengths

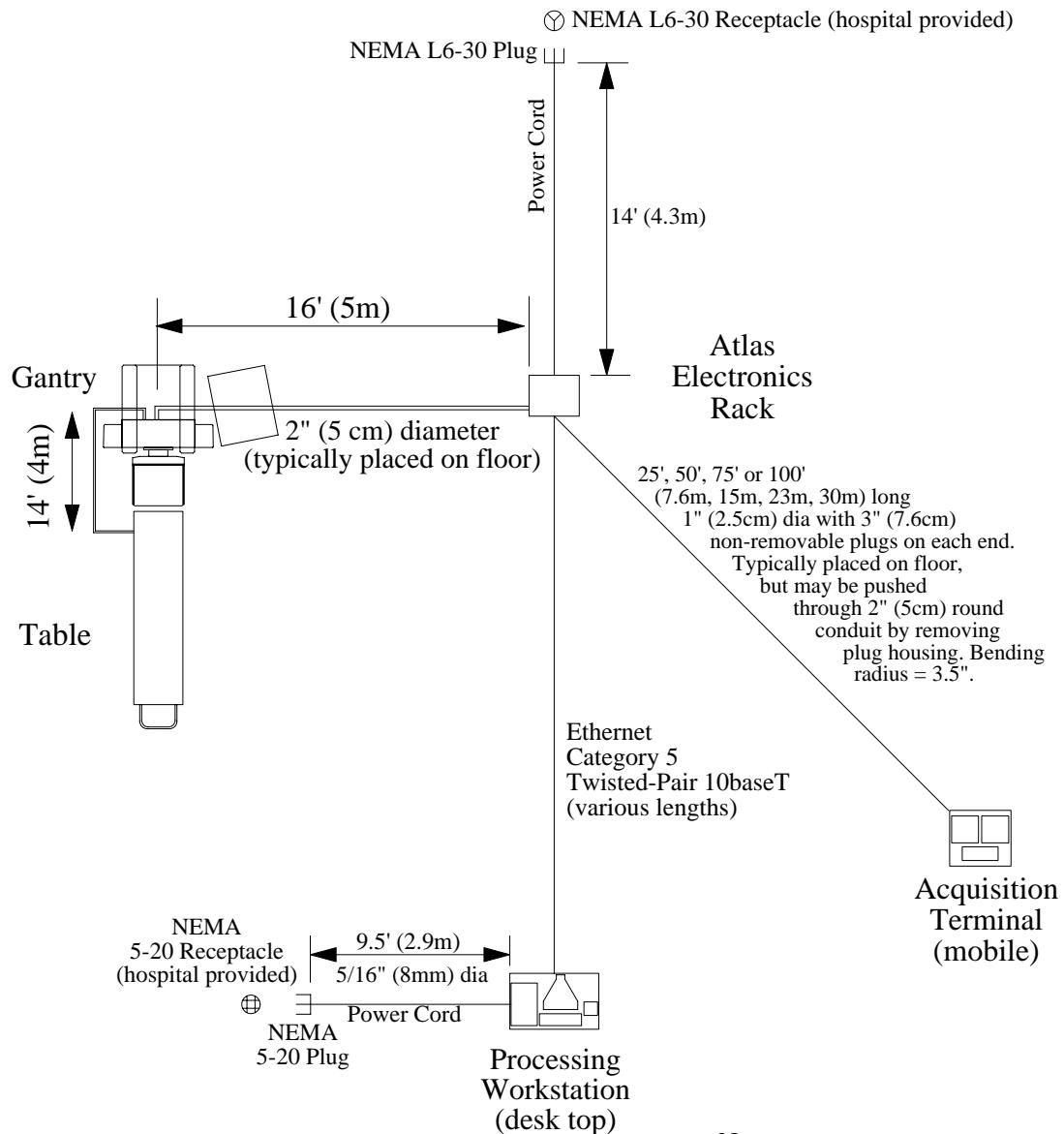
Forte *Power Pack* Cameras have the cable lengths shown below.



**Note:**  
Philips installers will perform all cable connections. If a hospital insists that cables be run through walls, ceilings or conduits, hospital personnel must run those cables through those structures.

## Gantry Cable Lengths (continued)

Forte *Atlas* Cameras have the cable lengths shown below.



**Note:**  
Philips installers will perform all cable connections. If a hospital insists that cables be run through walls, ceilings or conduits, hospital personnel must run those cables through those structures.

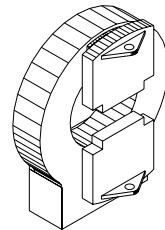
# Section 5

## Shipping Information

### Gantry (Shipping Size and Weight)

The weight of the Gantry (which Philips ships without Detectors or Power Pack) is:

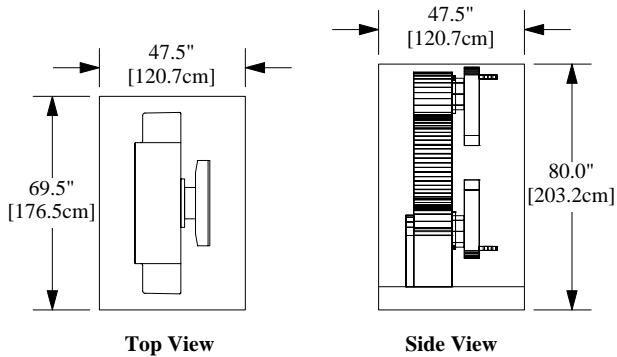
Gantry:	2,156 lbs	(978 Kg)
Crate:	350 lbs	(159 Kg)
Total:	2,506 lbs	(1,137 Kg)



The crated size of the Gantry is shown on the right.

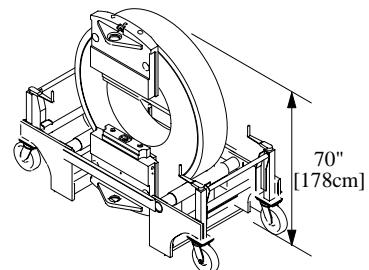
Document 9346-0052 contains trigger information and is available on this website:

<http://apps1.medical.philips.com/documents>

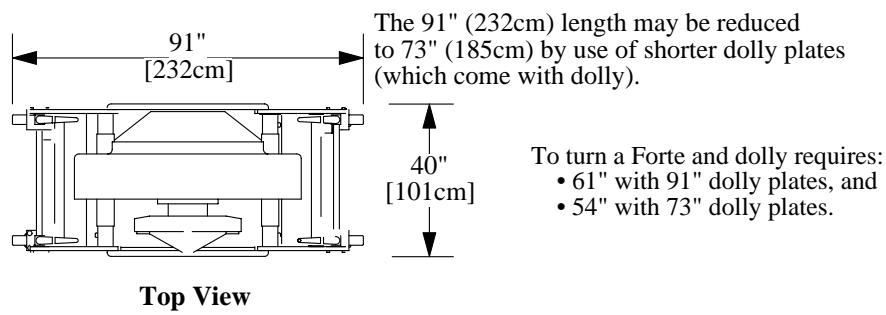


The weight of the Gantry on the dolly Philips uses to transport the Gantry within a hospital is:

Gantry:	2,156 lbs	(978 Kg)
Dolly:	600 lbs	(272 Kg) (est)
Total:	2,756 lbs	(1,250 Kg) (est)



The size of the Gantry on dolly is:

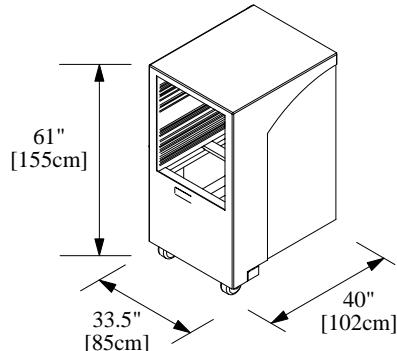


## **Collimator Storage Unit (Shipping Size and Weight)**

The shipping weight of the Collimator Storage Unit (which Philips ships without collimators) is:

Collimator Storage Unit:	1,068 lbs	(484 Kg)
Crate:	150 lbs	(68 Kg) (est)
Total:	1,218 lbs	(552 Kg) (est)

The uncrated size of Collimator Storage Unit is shown on the right.



## **Patient Table (Shipping Size and Weight)**

The shipping weight of the Patient Table is:

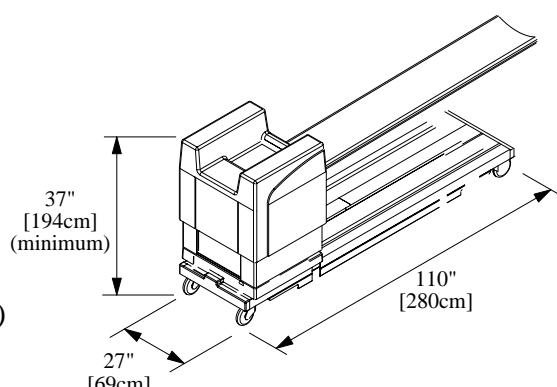
Patient Table:	850 lbs	(386 Kg)	(est)
Crate:	150 lbs	(68 Kg)	(est)
Total:	1,000 lbs	(454 Kg)	

The uncrated size of Patient Table is shown on the right.

If corners or elevators are too small to accomodate a 110" long table, the site must hire a rigger to get the table into the room.

Rigger information (document 9346-0052) is available on this website:

<http://apps1.medical.philips.com/documents>



Philips Engineers may obtain 9346-0052 rigger document from the "NM FS & Customer Support" hotlink on the Philips Milpitas internal website.

# Section 6

## Floor Loading

### General Floor Loading Information

Unless the floor is a reinforced 3,000 psi (211 kg/cm<sup>2</sup>), 4.5" thick, concrete slab poured on grade, a licensed structural engineer *must* evaluate floor loading capacity using the data in this section.

Refer to Section 1 of this document for explanations of the Forte Gantry, Collimator Storage Unit and Patient Table functions.

Section 3 describes anchor details.

This section presents floor loading requirements starting with the entire area of a typically sized room. This section also defines the loads under specific parts of the Forte Camera system (Gantry, Collimator Storage Unit and Table).

Floor loads depend on which collimators a customer purchases. This section contains calculations for a probable worst case set of collimators (pairs of LEGP, VXGP, MEGP and HEGP collimators).

Below is a list of all possible collimator types and weights so structural engineers can perform site-specific floor load calculations:

LEGP = 110 lbs	MEGP = 218 lbs
LEHR = 114 lbs	HEGP = 235 lbs
VXGP = 110 lbs	HEHR = 240 lbs (estimate)
VXHR = 119 lbs	MCD shields = 253 lbs (estimate)
VXUR = 126 lbs	Pinhole = 260 lbs

Collimators come in pairs except the Pinhole which comes as a single collimator.

The calculations in this section pertain to Forte *Power Pack* cameras. Forte *Atlas* cameras (which are older) have a smaller compartment behind the Gantry and are 164 lbs lighter. However, Forte *Atlas* camera installations include an extra piece of equipment. The extra equipment, an *Atlas Electronics Rack*, weighs 211 lbs.

### **Seismic**

The calculations in this section do not include seismic loads. Sites that must meet seismic requirements should obtain a copy of Philip's California Forte OSHPD Pre-Approval Package from this website:

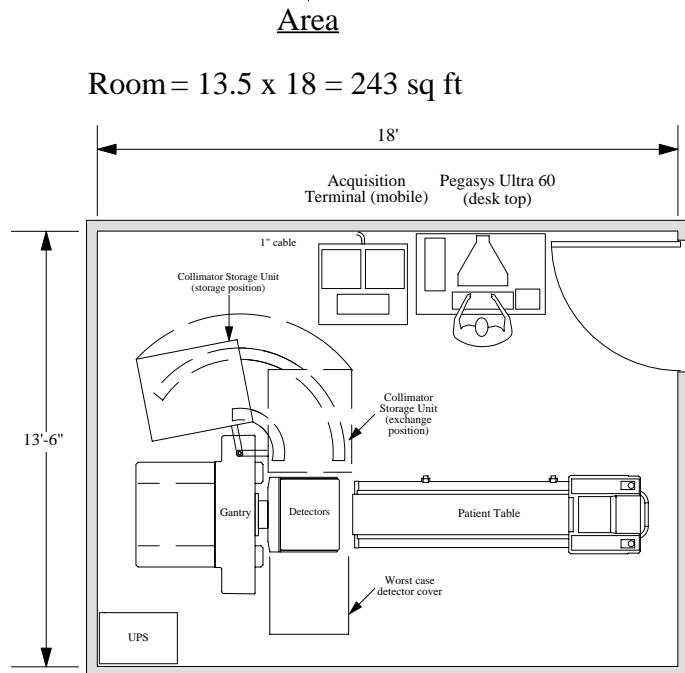
<http://apps1.medical.philips.com/documents>

Note: The OSHPD package assumes a camera weight that includes two 295 lb UHGP collimators (which Philips no longer sells). The following calculations treat camera and collimator weights separately.

## **“Room” Floor Loading**

### **Without Collimators**

<u>Components</u>	<u>Weight</u>
PegBlade & Monitor	96
Acquisition Terminal	185
Gantry (w/o collimators)	4,512
empty Collimator Storage	1,068
Patient Table	850
Patient	400
Technologists	400 (200+200)
UPS (optional)	<u>294</u>
Total	7,805 lbs



$$\text{Room Floor Loading (w/o collimators)} = 7,805 \div 243 = 32 \text{ lbs/ft}^2$$

### **With Collimators**

<u>Components</u>	<u>Weight</u>
PegUltra & Monitor	96
Acquisition Terminal	185
Gantry (w/o collimators)	4,512
empty Collimator Storage	1,068
Patient Table	850
Patient	400
Technologists	400 (200+200)
UPS (optional)	<u>294</u>
Collimators in Storage Unit:	
LEGP	220 (2 x 110)
VXGP	220 (2 x 110)
MEGP	436 (2 x 218)
Collimators on Detectors:	
HEGP	<u>470</u> (2 x 235)
Total	9,151 lbs

$$\text{Room Floor Loading (w/ collimators)} = 9,127 \div 243 = 38 \text{ lbs/ft}^2$$

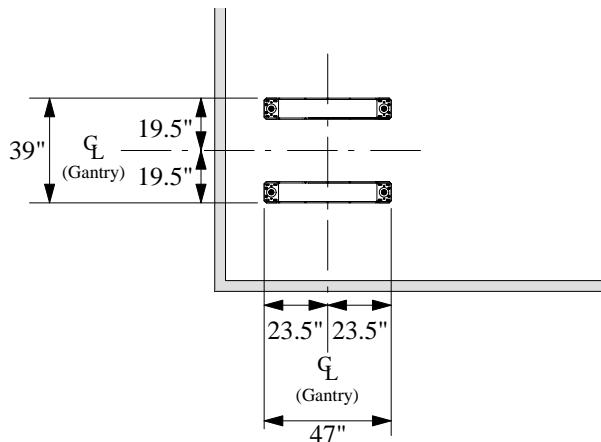
**Note:** If a structural engineer does not know which collimators a customer will purchase or if a customer will likely add other collimators in the future, Philips recommends performing floor load calculations based on the above four collimator pairs.

## **“Gantry” Floor Loading**

The Gantry rests on two Gantry Support Legs. The figures below describe floor loading in the area bounded by the two Gantry Support Legs with (1) no collimators, and (2) with the heaviest collimators, on the Detectors.

### **Without Collimators**

<u>Components</u>	<u>Weight</u>	<u>Area</u>
Gantry	4,512	Gantry Support Legs = $(39 \times 47)/144$
Total	4,512 lbs	= 12.7 sq ft



$$\text{Gantry Floor Loading (w/o collimators)} = 4,512 \div 12.7 = \mathbf{354 \text{ lbs}/\text{ft}^2}$$

### **With Collimators**

<u>Components</u>	<u>Weight</u>
Gantry w/o Collimators	4,512
Collimators on Detectors:	
HEGP	470 (2 x 235)
Total	4,982 lbs

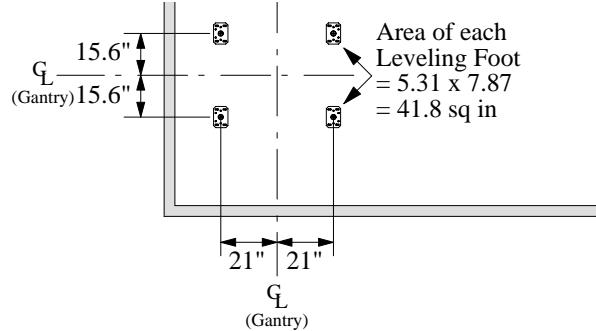
$$\text{Gantry Floor Loading (w/ HEGP collimators)} = 4,982 \div 12.7 = \mathbf{391 \text{ lbs}/\text{ft}^2}$$

**Note:** Even if a customer does not order heavy collimators (like a pair of HEGP collimators), Philips recommends that structural engineers assume HEGP collimator pairs for the above calculation.

## **“Gantry” Point Loading**

The two Gantry Support Legs rest on four Leveling Feet. The calculations on this page assume the Leveling Feet are point loads. The numbers below describe Gantry Point loading for the four Leveling Feet with the heaviest (HEGP) collimators on the Detectors.

<u>Components</u>	<u>Weight</u>
Gantry w/o Collimators	4,512
Collimators on Detector HEGP	<u>470</u> (2 x 235)
Total	4,982 lbs



**Note:** The point load on both rear Leveling Feet is always an upward overturn moment.

Worst case point loads occur when operators put the two Detectors 90° apart and rotate the Gantry so the Detector weights are over either the left or right pairs of Leveling Feet.

<u>Detectors/Collimators Over Left Leveling Feet</u>		<u>Detectors/Collimators Over Right Leveling Feet</u>	
<u>Leveling Foot</u>	<u>Point Load</u>	<u>Leveling Foot</u>	<u>Point Load</u>
Left rear	= <b>569 lbs</b>	Left rear	= <b>-1,226 lbs</b>
Right rear	= <b>-1,226 lbs</b>	Right rear	= <b>569 lbs</b>
Left front	= <b>3,719 lbs</b>	Left front	= <b>1,922 lbs</b>
Right front	= <b>1,922 lbs</b>	Right front	= <b>3,719 lbs</b>

Detector #1  
Detector #2  
Left Front Leveling Foot  
Right Rear Leveling Foot  
Right Front Leveling Foot

Left Rear Leveling Foot  
Detector #2  
Detector #1  
Left Front Leveling Foot  
Right Front Leveling Foot

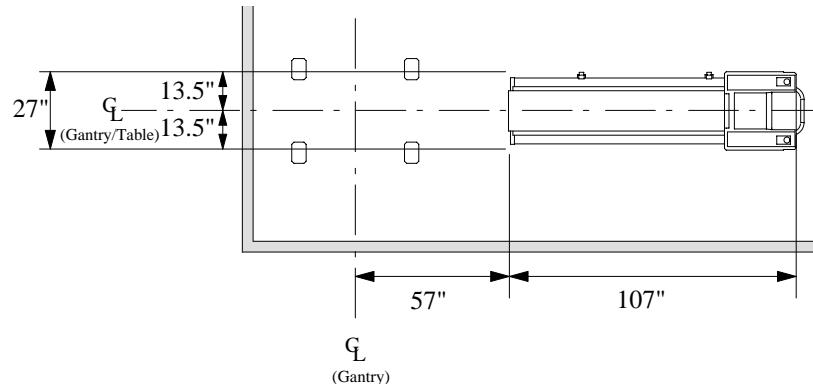
## **Table Floor Load”**

The Patient Table is on wheels. However, unless moved out of the way to accommodate wheel chair or gurney-bound patients, the table remains in a fixed location.

The Patient Table includes a movable pallet upon which the patient lays. When initiated by the operator, motors move the pallet in and out of the Gantry. The pallet also moves vertically and horizontally.

### **Without Patient**

<u>Components</u>	<u>Weight</u>	<u>Area</u>
Patient Table	850	Patient Table = $(27 \times 107)/144 = 20.1 \text{ sq ft}$
Total	850 lbs	



$$\text{Table Floor Loading (without patient)} = 850 \div 20.1 = \mathbf{42 \text{ lbs}/\text{ft}^2}$$

### **With Patient**

<u>Components</u>	<u>Weight</u>
Patient Table	850
Patient	400
Total	1,250 lbs

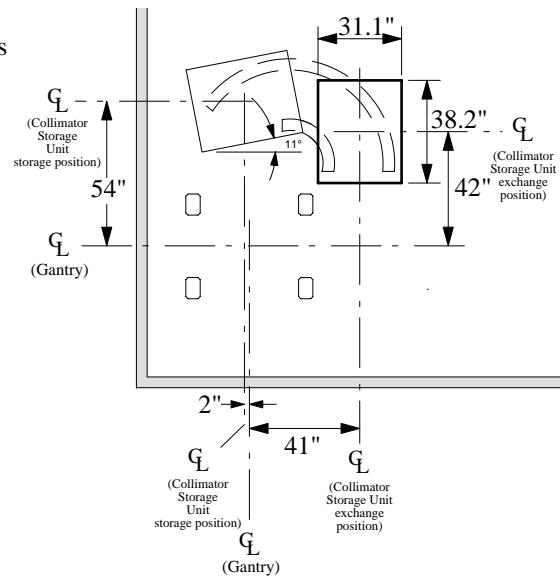
$$\text{Table Floor Loading (with patient)} = 1,250 \div 20.1 = \mathbf{62 \text{ lbs}/\text{ft}^2}$$

## “Collimator Storage Unit” Floor Loading

The Collimator Storage Unit moves between two fixed locations along a 90° arc. The fixed positions are the “exchange position” and the “storage position. The Collimator Storage Unit may contain up to eight Collimators (four pairs).

### Without Collimators

<u>Components</u>	<u>Weight</u>	<u>Area</u>
Collimator Storage Unit without collimators	= <u>1,068</u>	Unit = $(31.1 \times 38.2)/144 = 8.25 \text{ sq ft}$
Total	= 1,068 lbs	



$$\begin{aligned} \text{Manual Collimator Storage Unit Floor Loading (w/o collimators)} &= 1,068 \div 8.25 \\ &= 129 \text{ lbs/ft}^2 \end{aligned}$$

### With Collimators

<u>Components</u>	<u>Weight</u>
Collimator Storage Unit without collimators	= 1,068
Collimators:	
LEGP	= 220 (2 x 110)
VXGP	= 220 (2 x 110)
MEGP	= 436 (2 x 218)
HEGP	= <u>470</u> (2 x 235)
Total	= 2,414 lbs

$$\begin{aligned} \text{Manual Collimator Storage Unit Floor Loading (with collimators)} &= 2,414 \div 8.25 \\ &= 293 \text{ lbs/ft}^2 \end{aligned}$$

## Collimator Storage Unit “Point Loads”

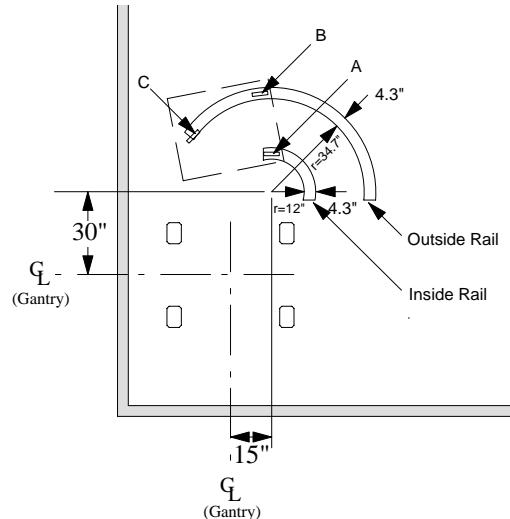
The Collimator Storage Unit sits on three wheels. The inside front wheel ("A" in below drawing) rides on the inside rail. Both the outside front wheel ("B") and the middle rear wheel ("C") ride on the outside rail.

The wheels are rubber-coated, 5.8" in diameter and 1.3" wide.

The rails are steel plates, 4.3" wide and 0.12" thick. The rails attach to the floor by simple screws (not anchors)

### Without Collimators

<u>Components</u>	<u>Weight</u>
Collimator Storage Unit without collimators	= <u>1,068</u>
Total	= 1,068 lbs



### Manual Collimator Storage Unit Point Loads (w/o collimators)

$$\text{"A" (Inside front wheel load)} = 1,068 \div 4 = \mathbf{267 \text{ lbs}}$$

$$\text{"B" (Outside front wheel load)} = 1,068 \div 4 = \mathbf{267 \text{ lbs}}$$

$$\text{"C" (Middle rear wheel load)} = 1,068 \div 2 = \mathbf{534 \text{ lbs}}$$

### With Collimators

<u>Components</u>	<u>Weight</u>
Collimator Storage Unit without collimators	= 1,068
Collimators	
LEGP	= 220 (2 x 110)
VXGP	= 220 (2 x 110)
MEGP	= 436 (2 x 218)
HEGP	= <u>470</u> (2 x 235)
Total	= 2,414 lbs

### Manual Collimator Storage Unit Point Loads (with four collimator pairs)

$$\text{Inside front wheel load} = 2,414 \div 4 = \mathbf{604 \text{ lbs}}$$

$$\text{Outside front wheel load} = 2,414 \div 4 = \mathbf{604 \text{ lbs}}$$

$$\text{Rear wheel load} = 2,414 \div 2 = \mathbf{1,207 \text{ lbs}}$$

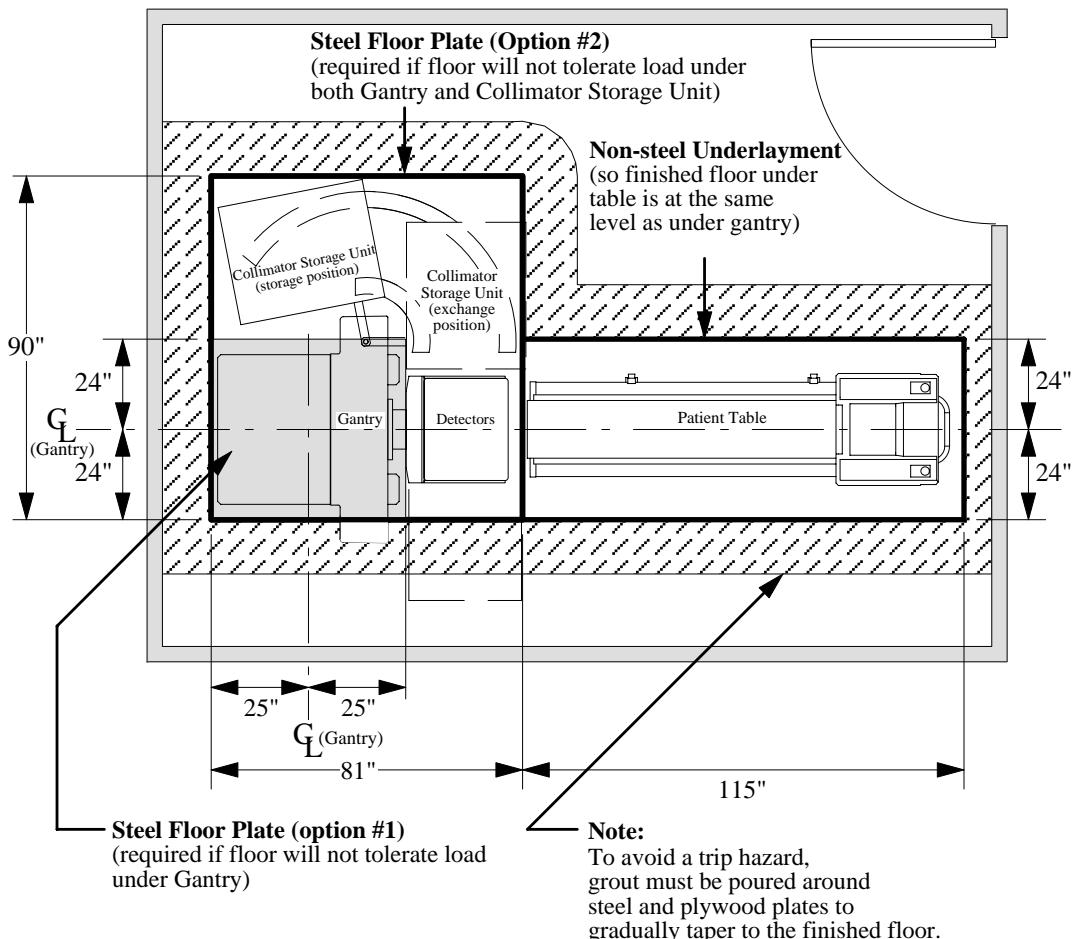
## **Through Bolts or Steel Plate (optional)**

**Through Bolts.** In sites where the floor will not permit anchors, a licensed structural engineer must design a through-bolt system. The design must specify the length/grade of bolts, the size/grade of washers and any support structures that the customer's contractor must install.

**Steel Plate.** In sites where the floor will not tolerate the equipment load and where reinforcing from underneath is undesirable, a licensed structural engineer must design a steel floor plate to distribute the load. The design must specify (a) the size/thickness of the steel plate, (b) the structure-to-plate attachment plan, and (c) whether Philips will attach its equipment by through bolting or drill/tapping into the steel plate.

If the structural engineer specifies that Philips will drill and tap into the steel plate, the steel plate must be at least 1/2" thick.

The steel plate (or plates) must cover at least the area under the four Gantry Leveling Feet (option #1 in figure below). The structural engineer must decide if a steel plate must also cover the area under the Collimator Storage Unit Rails (option #2 in figure).



A contractor must install and attach the steel plate to the structure according to the structural engineer's design.

The finished floor under the Gantry, Collimator Storage Unit and Patient Table must be at the same level (see tolerances on page 1-2). This will require the contractor to install underlayment (e.g., plywood) under the Patient Table. If the steel plate does not cover the area under the Collimator Storage Unit, the contractor must also provide underlayment under that area.

If the contractor must cut a steel plate to bring it into the room, there must be no seams under the four Gantry Leveling Feet and Collimator Storage Rails. The structural engineer must specify the sizes of the pieces and the type of welds between the steel plate pieces.

To avoid trip hazards, a contractor must ensure the finished floor tapers gradually away from the raiser floor level under the Gantry, Collimator Storage Unit and Patient Table.